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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,725	07/01/2003	Toshihisa Yamamoto	450100-4681.1	6124

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EXAMINER	
HANNETT, JAMES M	
ART UNIT	PAPER NUMBER
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/611,725	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	James M. Hannett	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *49-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *49-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/1/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/1/2003 has been considered by the examiner.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Image processing system for generating interpolated data based on color-difference signals.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1: Claims 49-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,555,023 Maenaka et al in view of USPN 5,692,071 Govaert.

2: As for Claim 49, Maenaka et al teaches on Column 6, Lines 29-58 a system that takes in image data captured by an image sensor and performs interpolation in the image data in both a horizontal and vertical direction. Furthermore, Maenaka et al teaches that the then interpolated image data will be sent to a correlation value calculator in which a correlation value is calculated by performing the absolute value of a difference between Green and red pixels in both the vertical and horizontal direction. Therefore, the examiner believes these steps of Maenaka et al to be equivalent to the steps of: an interpolated pixel data generating means (Column 6, Lines 44-46 and 55-57) for interpolating pixel data in at least two directions (interpolation is performed in the vertical and horizontal directions) based on a position of said pixel data and/or pixel data around said position (the data used corresponds to the pixels depicted in Figure 9. as seen in figure 9 the chosen data is pixel data that is in a 3x3 area around the center pixel), said pixel data being generated based on an imaging signal coming from a solid-state image sensor (Element 1 in Figure 1) in which an imaging light enters through a color filter having a different spectral characteristic for each pixel, thereby separately generating interpolated pixel data in said at least two directions (interpolated data is calculated in the vertical and horizontal directions); a correlation detecting means (Elements 261-264 in Figure 2) for detecting a correlation value indicative of a degree of correlation in each of said at least two directions (horizontal and vertical) of said interpolated pixel data generated by said interpolated pixel data generating means; a color-difference signal detecting means (Column 6, Lines 39-42 and Lines 51-53) for detecting a color-difference signal of each of said interpolated pixel data in each of said at least

two directions (horizontal and vertical) generated by said interpolated pixel data generating means and interpolated pixel data added with said correlation value detected by said correlation detecting means in each of said at least two directions; Maenaka et al further teaches that subsequent image processing is performed on the image data and the image data is then output at Element 25 of Figure 1. Therefore, Maenaka et al teaches an image generating means (25) for generating an image based on the interpolated pixel. However, Maenaka et al teaches calculating the color difference signals that were based on interpolated image data. However, Maenaka et al sending the calculated difference signals to a selector for selecting a smallest one of the color-difference signals.

Govaert teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 a color image processing method for generating device-dependent color signals. Govaert teaches that it is advantageous in image processing system to analyze color difference signals or interpolated image data to determine the smallest difference between the target color and the produced color. Govaert further teaches that by selecting the color difference signal with the smallest value, a color image can be output that most closely resembles the desired color and matches a target CIELab color scheme. Therefore, improving image color reproducibility.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to output the calculated color difference values as calculated in Maenaka et al to the Color-difference signal selector of Govaert prior to outputting the signal at step (25) in order to determine the smallest difference between the target color and the produced color and select the color difference signal with the smallest value so that a color image can be output that

most closely resembles the desired color and matches a target CIELab color scheme. Therefore, improving image color reproducibility

3: In regards to Claim 50, Govaert further teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 the selecting means selects the color difference signal corresponding to the color difference signal with the smallest value. Therefore, Govaert teaches selecting one of the color-difference signal of said interpolated pixel data in each of said at least two directions and the color-difference signal of the interpolated pixel data computed by use of said correlation value in each of said at least two directions. Although Govaert does not specifically disclose the control means that controls the selection process, it is inherent that a control means exists in order to perform the selection.

4: As for Claim 51, Govaert further teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 said selecting means selects the smallest of the color-difference signals. Furthermore, it is inherent that the color-difference will have a predetermined value.

5: In regards to Claim 52, Maenaka et al further teaches on Column 6, Lines 29-58 an absolute value converting circuit for making absolute the color-difference signals of said interpolated pixel data in each of said at least two directions (horizontal and vertical) and said interpolated pixel data computed by use of said correlation value in each of said at least two directions; Furthermore, as stated above in Claim 49, the selector is arranged after the color difference calculating circuit of Maenaka et al. Therefore, said selecting means selects a smallest color-difference signal outputted from said absolute value converting circuit.

6: As for Claim 53, Maenaka et al teaches on Column 6, Lines 29-58 a system that takes in image data captured by an image sensor and performs interpolation in the image data in both a

horizontal and vertical direction. Furthermore, Maenaka et al teaches that the then interpolated image data will be sent to a correlation value calculator in which a correlation value is calculated by performing the absolute value of a difference between Green and red pixels in both the vertical and horizontal direction. Therefore, the examiner believes these steps of Maenaka et al to be equivalent to the steps of: an interpolated pixel data generating means (Column 6, Lines 44-46 and 55-57) for interpolating pixel data in at least two directions (interpolation is performed in the vertical and horizontal directions) based on a position of said pixel data and/or pixel data around said position (the data used corresponds to the pixels depicted in Figure 9. as seen in figure 9 the chosen data is pixel data that is in a 3x3 area around the center pixel), said pixel data being generated based on an imaging signal coming from a solid-state image sensor (Element 1 in Figure 1) in which an imaging light enters through a color filter having a different spectral characteristic for each pixel, thereby separately generating interpolated pixel data in said at least two directions (interpolated data is calculated in the vertical and horizontal directions); a correlation detecting means (Elements 261-264 in Figure 2) for detecting a correlation value indicative of a degree of correlation in each of said at least two directions (horizontal and vertical) of said interpolated pixel data generated by said interpolated pixel data generating means; a color-difference signal detecting means (Column 6, Lines 39-42 and Lines 51-53) for detecting a color-difference signal of each of said interpolated pixel data in each of said at least two directions (horizontal and vertical) generated by said interpolated pixel data generating means and interpolated pixel data added with said correlation value detected by said correlation detecting means in each of said at least two directions; Maenaka et al further teaches that subsequent image processing is performed on the image data and the image data is then output at

Element 25 of Figure 1. Therefore, Maenaka et al teaches an image generating means (25) for generating an image based on the interpolated pixel. However, Maenaka et al teaches calculating the color difference signals that were based on interpolated image data. However, Maenaka et al sending the calculated difference signals to a selector for selecting a smallest one of the color-difference signals.

Govaert teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 a color image processing method for generating device-dependent color signals. Govaert teaches that it is advantageous in image processing system to analyze color difference signals or interpolated image data to determine the smallest difference between the target color and the produced color. Govaert further teaches that by selecting the color difference signal with the smallest value, a color image can be output that most closely resembles the desired color and matches a target CIELab color scheme. Therefore, improving image color reproducibility.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to output the calculated color difference values as calculated in Maenaka et al to the Color-difference signal selector of Govaert prior to outputting the signal at step (25) in order to determine the smallest difference between the target color and the produced color and select the color difference signal with the smallest value so that a color image can be output that most closely resembles the desired color and matches a target CIELab color scheme. Therefore, improving image color reproducibility

7: In regards to Claim 54, Govaert further teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 said selecting means selects the smallest of the color-difference signals. Therefore, This selected color difference signal will correspond to one of the color-difference

signal of said interpolated pixel data in each of said at least two directions and the color-difference signal of the interpolated pixel data computed by use of said correlation value in each of said at least two directions is selected.

8: As for Claim 55 Govaert further teaches on Column 7, Lines 38-60 and on Column 3, Lines 15-24 said selecting means selects the smallest of the color-difference signals. Furthermore, it is inherent that the color-difference will have a predetermined value.

9: In regards to Claim 56, Maenaka et al further teaches on Column 6, Lines 29-58 an absolute value converting circuit for making absolute the color-difference signals of said interpolated pixel data in each of said at least two directions (horizontal and vertical) and said interpolated pixel data computed by use of said correlation value in each of said at least two directions; Furthermore, as stated above in Claim 49, the selector is arranged after the color difference calculating circuit of Maenaka et al. Therefore, said selecting means selects a smallest color-difference signal outputted from said absolute value converting circuit.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2003/0133034 A1 Takahashi teaches the use of a camera system performing image processing; USPN 5,734,424 Sasaki teaches the use of an image processing apparatus using a weighted interpolation method; USPN 6,018,363 Horii teaches a signal processing method as depicted in Figure 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Hannett whose telephone number is 571-272-7309. The examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James M. Hannett
Examiner
Art Unit 2622

JMH
March 28, 2007

TUAN HO
PRIMARY EXAMINER